

Application No.: 10/028553

Case No.: 56009US002

REMARKS

Claims 1, 3 – 8, 10 – 21, 23 – 36, and 38 – 45 have been pending. Claims 10 and 39 are being canceled. Claims 1, 18, 19, and 36 are being amended.

Applicants are hereby amending claims 1, 18, 19, and 36 to recite the limitation that the polyorganosiloxane polyurea copolymer is the reaction product of a polydiorganosiloxane polyamine with a polyisocyanate (basis therefor being found, for example, at page 5, lines 14 – 16, and original claim 10) and the limitation that the polyorganosiloxane polyurea has a mole ratio of isocyanate to amine in a range of about 0.97:1 to about 1.03:1 (basis therefor being found, for example, at page 5, line 19).

Rejections under §§ 102/103

Claims 1, 3, 7, 10, 13 – 20, 22, 23, 27, 29 – 36, and 38 – 45 have been rejected under 35 U.S.C. § 102(b) as anticipated by, or in the alternative under 35 U.S.C. § 103(a) as obvious over, Sherman et al. (WO 96/34028). The rejections are traversed for the following reasons.

Applicants claim a pressure sensitive adhesive comprising a silicone tackifying resin; a polydiorganosiloxane polyurea copolymer that is the reaction product of a polydiorganosiloxane polyamine with a polyisocyanate (that is, the polydiorganosiloxane polyurea copolymer is not the reaction product of a monoamine and/or a monoisocyanate), wherein the mole ratio of isocyanate to amine is in a range of about 0.97:1 to about 1.03:1; and a plasticizer; wherein the silicone tackifying resin and polydiorganosiloxane polyurea copolymer are generally uniformly distributed; the pressure sensitive adhesive is organic solvent-based; the silicone tackifying resin is present in an amount of at least about 55 wt-%, based on the weight of the silicone tackifying resin and the polydiorganosiloxane polyurea copolymer; and the plasticizer is present in an amount sufficient to provide a generally uniform distribution of the polydiorganosiloxane polyurea copolymer and the silicone tackifying resin.

Sherman does not appear to teach or suggest a pressure sensitive adhesive comprising a polydiorganosiloxane polyurea copolymer that is the reaction product of a polydiorganosiloxane polyamine with a polyisocyanate wherein the mole ratio of isocyanate to amine is in the range of about 0.97:1 to about 1.03:1. Applicants refer the Examiner, for example, to the table at page 13 of Sherman. Columns X(b) and X(c) refer to oligomers made from monoamine and/or

Application No.: 10/028553

Case No.: 56009US002

monoisocyanate (see, for example, page 13, lines 13 – 14). These oligomers, as well as the oligomers of examples 1 – 5 of Sherman, are therefore excluded from Applicants' claims. The oligomers of column X(a) have a maximum degree of oligomerization of 22 (that is, $t+m+2 = 22$ when the maximum value of t is 12 (see page 13, line 3) and the maximum value of m is 8 (see page 12, line 25)). The oligomers of column X(a) have a mole ratio of isocyanate to amine between 1.05:1 (that is, $(t+m+3)/(t+m+2)$ is 23/22 or approximately 1.05 when t is 12 and m is 8) and 1.33:1 (that is, $(t+m+3)/(t+m+2)$ is 4/3 or 1.33 when m is 1 and m is 0). Therefore, the oligomers of column X(a) have a mole ratio of isocyanate to amine in the range of 1.05:1 to 1.33:1. Similarly, following the formulas of the table, the oligomers of column X(d) have a maximum degree of oligomerization of 22, and a mole ratio of isocyanate to amine between about 0.67:1 and 0.95:1. Oligomers that fall within this range are also excluded from Applicants' claims. Applicants' claims are therefore novel and patentable over Sherman.

In addition, the pressure sensitive adhesives of the invention comprise a silicone tackifying resin in a relatively high amount (for example, at least about 55 wt-%, based on the weight of the silicone tackifying resin and the polydiorganosiloxane polyurea copolymer). Tackifying resins are employed to increase peel adhesion and to limit the level of adhesion build when the adhesive is disposed and aged on a release liner. However, when the tackifying resin is used in relatively high amounts in the adhesives of the invention and the adhesive is applied from solvent to a release liner, a significant difference in tack occurs between the air interface and the liner interface of the adhesive. Specifically, the air interface typically exhibits significantly higher tack than the adhesive face in contact with the liner. This loss in tack on the liner side of the adhesive is believed to be due to a concentration gradient in silicone tackifying resin that occurs upon drying the adhesive, where the adhesive air interface is depleted in tackifying resin and the liner side of the adhesive is enriched in tackifying resin. (See, for example, page 14, lines 9 – 20.)

Surprisingly, Applicants have discovered that the increase in silicone tackifying resin concentration on the liner side of the adhesive and consequent loss in tack can be minimized or eliminated by employing a plasticizer in the adhesive composition. The resulting adhesives have a good balance of tack, peel, and shear holding power.

Sherman does not appear to teach or suggest that the increase of tackifying resin concentration on the liner side of the adhesive of the invention and consequent loss in tack could be

Application No.: 10/028553

Case No.: 56009US002

minimized or eliminated by employing a plasticizer in the adhesive composition of the invention. Applicants therefore respectfully request that the rejections of claims 1, 3, 7, 10, 13 – 20, 22, 23, 27, 29 – 36, and 38 – 45 under §§ 102/103 based on Sherman be withdrawn.

Rejections under § 103

Claims 8, 11, 12, 21, and 28 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sherman. As discussed above, Sherman does not appear to teach or suggest a pressure sensitive adhesive comprising a polydiorganosiloxane polyurea copolymer that is the reaction product of a polydiorganosiloxane polyamine with a polyisocyanate wherein the mole ratio of isocyanate to amine is in the range of about 0.97:1 to about 1.03:1, or that the increase in silicone tackifying resin concentration on the liner side of the adhesive and consequent loss in tack due to high amounts of silicone tackifying resin can be minimized or eliminated by employing a plasticizer in the adhesive composition. Applicants therefore respectfully request that the rejection of claims 8, 11, 12, 21, and 28 under § 103 based on Sherman be withdrawn.

Claims 4 – 6 and 24 – 26 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sherman in view of U.S. Patent No. 5,776,614 (Cifuentes et al.). The rejection is traversed for the following reasons.

Cifuentes discloses pressure sensitive adhesives obtained from reacting a mixture comprising at least one polydiorganosiloxane, at least one silicone resin copolymer, and at least one solvent or plasticizer selected from the group consisting of carboxylic acids having at least 6 carbon atoms and amines having at least 9 carbon atoms.

The Examiner has asserted that it would have been obvious to one of ordinary skill in the art to have added a plasticizer as taught by Cifuentes to the composition of Sherman because Cifuentes teaches that adding plasticizers produces a PSA with high tack and good peel adhesion.

Neither Sherman nor Cifuentes appear to teach or suggest a pressure sensitive adhesive comprising a polydiorganosiloxane polyurea copolymer that is the reaction product of a polydiorganosiloxane polyamine with a polyisocyanate wherein the mole ratio of isocyanate to amine is in the range of about 0.97:1 to about 1.03:1, or that the increase in silicone tackifying resin concentration on the liner side of the adhesive and consequent loss in tack due to high

Application No.: 10/028553

Case No.: 56009US002

amounts of silicone tackifying resin can be minimized or eliminated by employing a plasticizer in the adhesive composition.

In addition, the silicone resin of Cifuentes is soluble in the polydiorganosiloxane (see, column 4, lines 3 – 14). Applicants' silicone tackifying resin and the polydiorganosiloxane polyurea copolymer appear to phase separate, resulting in a tackifying resin depletion at the air interface and an enrichment at the liner side. The silicone resin in Cifuentes reacts with the polydiorganosiloxane. Applicants' tackifying resin is not, and cannot be, reacted in with the polydiorganosiloxane polyurea copolymer.

It therefore would not have been obvious based upon the teaching of Cifuentes that the increase of tackifying resin concentration on the liner side of the adhesive of the invention and consequent loss in tack could be minimized or eliminated by employing a plasticizer in the adhesive composition of the invention. Applicants therefore respectfully request that the rejection under § 103 based upon Sherman in view of Cifuentes be withdrawn.

Claims 1, 3 – 7, 10, 13 – 20, 23 – 27, 29 – 36, and 38 – 45 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sherman in view of U.S. Patent No. 4,882,377 (Sweet et al.). The rejection is traversed for the following reasons.

Sweet discloses a silicone elastomer composition comprising a homogenous mixture of a silicone pressure sensitive adhesive composition, a crosslinkable silicone elastomer composition, and, optionally, a viscosity reducing agent. The silicone elastomer composition appears to be a homogenous mixture of silicone pressure sensitive adhesive and crosslinkable silicone elastomer composition regardless of whether the optional viscosity reducing agent is employed or not.

The Examiner has asserted that it would have been obvious to one of ordinary skill in the art to have added a plasticizer as taught by Sweet to the composition of Sherman because Sweet teaches that adding plasticizers as claimed produces a PSA with increased tack and adhesion properties.

Sweet does not appear to teach or suggest a pressure sensitive adhesive comprising a polydiorganosiloxane polyurea copolymer that is the reaction product of a polydiorganosiloxane polyamine with a polyisocyanate wherein the mole ratio of isocyanate to amine is in the range of about 0.97:1 to about 1.03:1. Nor Sweet does appear to teach or suggest that employing a plasticizer in a pressure sensitive adhesive comprising a silicone tackifying resin and a

Application No.: 10/028553

Case No.: 56009US002

polydiorganosiloxane polyurea copolymer would minimize or eliminate the increase in silicone tackifying resin concentration and consequent loss in tack on the liner side of the adhesive when it is applied from solvent to a release liner. Applicants' invention is therefore unobvious and patentable over the combination of Sherman and Sweet, and Applicants respectfully request that the rejection under § 103 based upon Sherman in view of Sweet be withdrawn.

Concluding Remarks

In view of the above, it is submitted that the application is in condition for allowance. Reconsideration and allowance of Applicants' claims are respectfully requested.

Respectfully submitted,

March 14, 2005

Date

By: Lisa P. Fulton
Lisa P. Fulton, Reg. No.: 55,195
Telephone No.: (651) 733-1260

Office of Intellectual Property Counsel
3M Innovative Properties Company
Facsimile No.: 651-736-3833